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In this month's

ROD & Custom

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AUGUST

1958

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the starting line



LATECOMERS to the science of automotive customizing have been wondering about the complexities they'll meet when they undertake the restyling of their car's original shape by dropping the roof line — more commonly known as top chopping. Well, never content to permit such interesting queries to lie around our offices very long unanswered, we hustled out and rounded up so much chopping material that it takes a full twenty of the pages in this edition to reveal just what mysteries await the eager turret hacker.

But there is really quite a bit more behind this top chopping sequence than meets the eye. In our own admittedly underhanded way we are hoping to interest both the older customizers as well as the younger up-and-coming restylers in proceeding with more radical metalwork than is currently being done. A quick summation of all the customs studied at recent car shows across the land makes it evident that the trend is toward less radical metalwork, with emphasis being placed more and more on such trivia as astonishing paint treatments, Hi-Fi sets in glove boxes, rear seat TV, and so forth. This is customizing???

Popular humor-writer Carl Kohler has answered our plea to help emphasize our complaints by whipping up a piece on non-conformity. And this he has done, the result closely preceding top chopping.

Of course, all of this is intended to fire you up to the point where you'll admit that radical paint does not a custom make, or that dice dangling from a rear vision mirror aren't the true enthusiast's idea of a fully customized interior.

I think a lot of the trouble lies in the fact that more and more guys are spending their loot to buy as late a model car as they can afford which, obviously, leaves nothing left over for rework. It used to be that about half of what the purse contained went for the chariot, the other half was gladly given to the closest body working emporium. Now probably 95% of that hard earned green stuff reaches the hands of Mr. New Car Dealer while the remaining 5% goes into the till of service stations. Come on now, we used to settle for radically reworked but older cars. Has that era disappeared? *

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ROD & CUSTOM

OUR READERS WRITERS

NEWCOMER

I've been a custom fan for just about six months, and I have enjoyed your magazine ever since I began reading it.

I have a couple of questions. How long have rodding and customizing been going on? And how did the word "custom" come in? I always thought a custom was something everybody did, but not everyone changes cars.

Charles Colmery Kingsport, Tennessee

The hobbies of hot rodding and custom car building are as old as the auto itself. The first cars were certainly custom built since often only one of a kind was made. And when a particularly good chassis and body combination was hit upon, further engine refinement was tried to increase performance. However, you probably mean the terms as they are applied today. We'd say 1913 for hot rodding as we know it (see R & C for Sept. '57) and stock car customizing "long about the '20's."

The word custom has several applications, Chuck. Among them "... a habitual course of action, or long established practice." And, "...made or done to order."

OUT OF THE 48

You-all are finally hearing from we Rebels — representatives of the only state not yet accounted for in the Out of The 48 series.

No custom body shops, that's why.

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WRITE—or wrong

Nobody even knows that Tennessee has been admitted to the Union.

But to be serious, let us apologize for our state. What few customs we do have are built from pure junk. Take a car to a body shop for restyling and you'll get thrown out on your ear. Sorry I don't have a car to send in, but maybe someday someone from around here will help you complete the "48."

Dave Mason Beechgrove, Tennessee
• Remember you said it, Dave, we didn't.

HOW COME?

You noted in the Starting Line column not long ago (April '58) that the auto magazine's competition is picking up faster than things at a drag strip. However, you say you have 6 erstwhile competitors. I count 15 at the local mag stand. But don't worry; they contain stuff you guys ran years ago. One example, on the cover of (*deleted*), was a car run by you back in June of 1953 — the same photos! So as long as these guys are following you by over four years and giving their gullible readers the same diet again, staunch supporters of R & C will keep your circulation on top — right where it belongs.

John Hershey Allentown, Penna.
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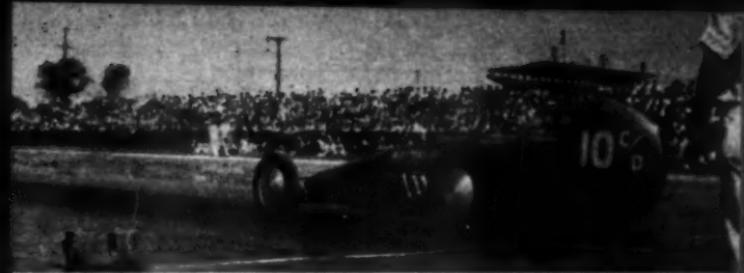
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BUG ENGINEERING, P.O. Box 91, West Covina, Calif., builder of a popular line of karts (see July '58 R & C), announces a new steering wheel easily adaptable to all types of small cars, including $\frac{1}{4}$ -midgets, etc. Prices run from \$7.50 (in bare metal) to \$8.95 (chrome plated). No welding necessary. Bug also has a new line of tapered Timken bearing wheels fitted with long-lasting "knobby" tires for the ultimate in traction. \$12.50 each is a real bargain. Write Bug Engineering for full information on these fine accessories.

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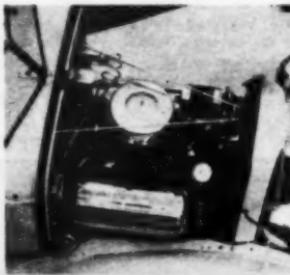
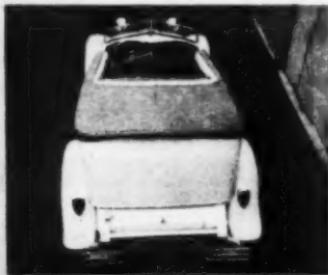
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Jim Potter picks the...

YEAR'S

I would have to be pretty heartless to pick from all the nation's hot rods the ones that I felt were the ten very best. Objections would be raised from all sides if certain cars were flatly said to be better than others. Instead, I am attempting here to reveal what the ten best types of hot rods are — what styles are presently meeting favor with rodders from the coast of Maine to Southern California.

So, with

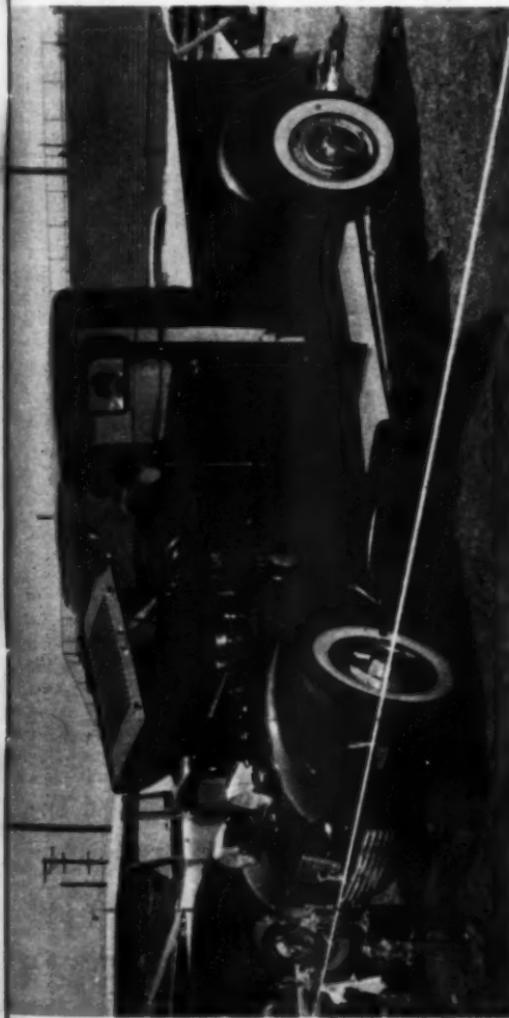


Converted from the once-popular short-bodied Victoria sedan, this '32 Ford takes on eye-appeal that is at once inviting for a spin along tree-shaded roads because of its new sporty phaeton styling. Bernie Stein, of Hayward, Calif., wanted a show-stopper that he could be proud of, so after 1½ years of personal labor, it was ready. The transformation required cutting off the sedan body and filling in the rough edges, then completely resheathinging the interior, using Sancel wood and white Naugahyde. Installed by Ben Jones of King Cavers, of Hayward. It has a Fiberglas cownd, aluminum fivewall, modified '33 Chrysler V8 under hood.

ROD & CUSTOM

BEST HOT RODS

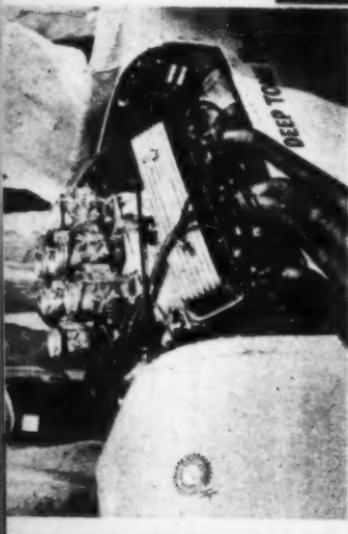
So, without further ado, on these pages are my selections.



An excellent example of a fine rod pickup is this Deuce from Long Beach, Calif., owned by Ed Cousins, member of the Renegades Car Club of the same city. Modifications include the completely upholstered interior in white Neugahyde trimmed with black piping, disk-type steering wheel, full complement of Stewart-Warner instruments mounted in the center of the dash panel, and a highly modified V8 engine, complete with triple carburetors, chromed air cleaners, etc. The pickup body section has a special white tarpaulin, and the owner always carries full safety equipment, including first-aid kit, flares, and special road tools for emergencies.



BEST



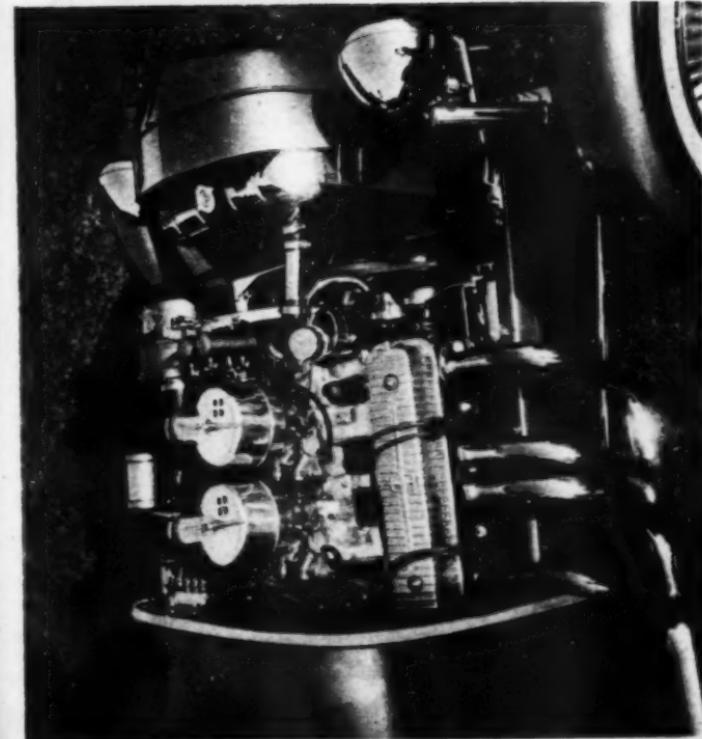
Top Eliminator at the National Championship Drags in Oklahoma City is this 1300-pound yellow dragster. Driven by Buddy Sampson of Phoenix, Ariz., the "Money Oldsmobile 442," features motor-cycle wheels and tires on front, racing slicks on the rear. It's powered by either a 415 or 461-cubic-inch Olds engine equipped with a

JULY, 1958

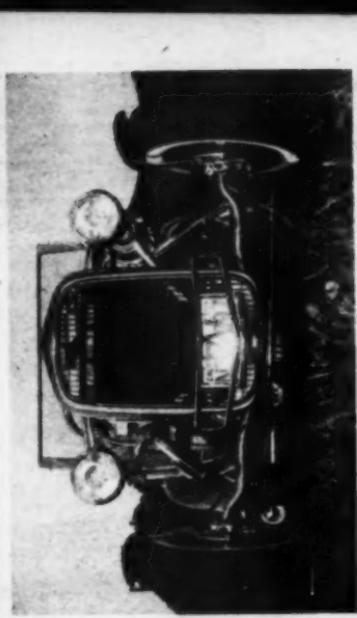
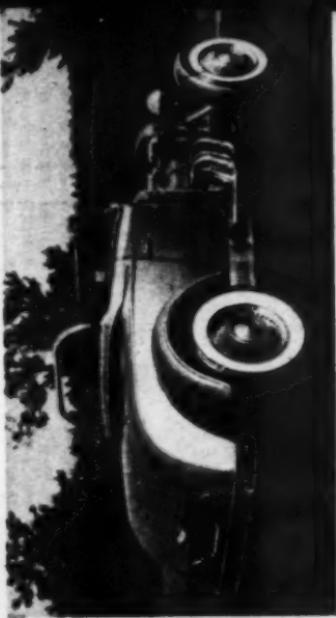
Howard cam and Weland manifold; the bigger engine did the job that won the five-foot trophy for Sampson and his crew, Joe Dillon and Lefty Maderbach. Using direct drive, the machine completed through the quarter-mile distance in only 10.42 seconds, shortest elapsed time of the meet. Top speed was 141.50 mph.

one very maneuverable, using almost envelope, no machine stampedes through the quarter-mile distance in only 10.42 seconds, shortest elapsed time of the meet. Top speed was 141.50 mph.

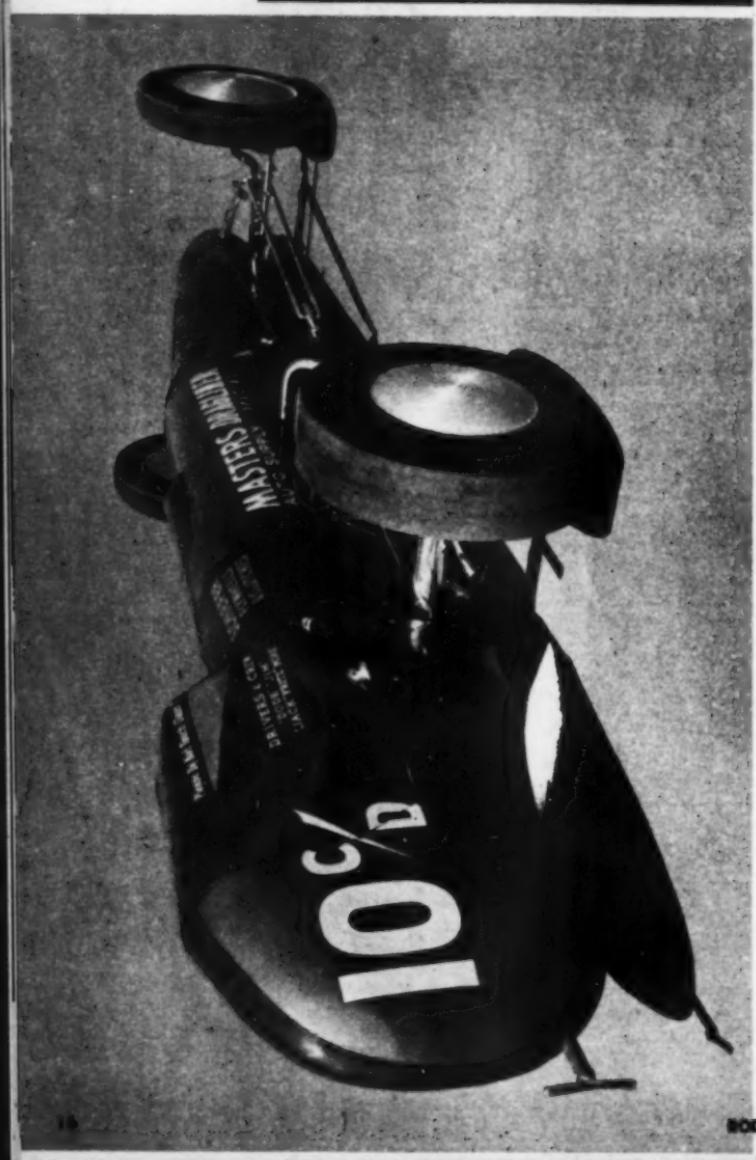
cycle wheels and tires on front, racing slicks on the rear. It's powered by either a 415 or 461-cubic-inch Olds engine equipped with a



Skillful mechanical ability is indicated in Bob Wong's beautifully modified '29 A roadster from San Jose, Calif. The engine compartment is crammed with a McCulloch-blown Lincoln V8 of 365 cubic inches, which develops a whining power that is at once startling. Two four-



barrels sit on an Edmunds manifold, and a Scintella Vertex magneto provides the spark. Milled heads up the compression ratio to 10-to-1, and a Chat Herbert roller cam controls parted valves. This powerhouse is hooked up to a three-speed gearbox through a Chrysler clutch.



Voted the best engineered car at the National Championship Drags held at Oklahoma City last fall, this aerodynamically designed dragster is the ultimate in automotive know-how. Jim Nelson, Dede Martin, Fritz Offut, and Jack Randal made up the four-men team that designed and built the Master's Dragline. From Oceanside, Calif.

The car features a fully enclosed cockpit with weight concentrated on rear wheels to obtain maximum possible traction. It's powered by a '55 Chevy V8, bored to 3 7/8 inches, with an 11-de-1 compression ratio, Racer Brown cam, and four Holley carburetors. It has a two-piece drag link, joined in the center by a bellcrank.

Typical of a good reconditioned and highly modified street coupe is this '32 Ford, owned by Russ Aves of San Luis Obispo, California. The body is a reproduction of the original model, and the engine is a recent three-

page article.

AUGUST

ratio, Racer Brown cam, and four Holley carburetors. It has a two-piece drag link, joined in the center by a bellcrank.

Martin, Fritz Ohni, and Jack Handell make up the four-men team that designed and built the Master's Dragliner. From OceanSide, Calif.,

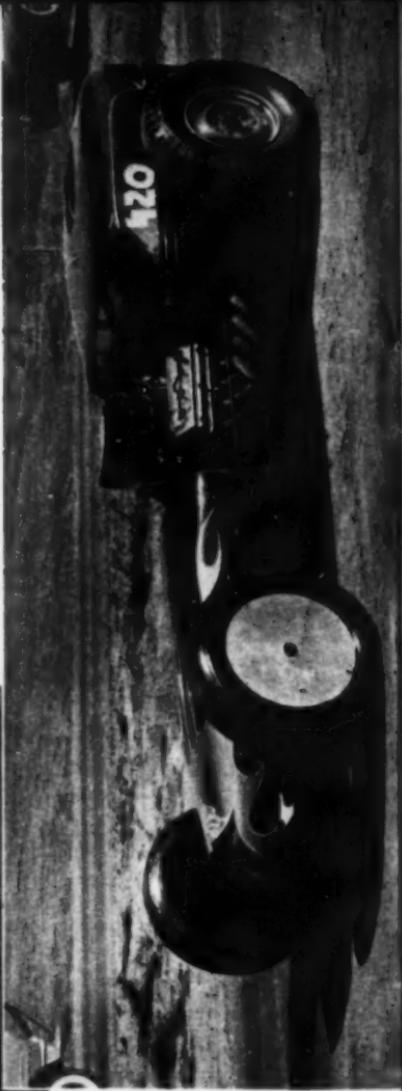
Typical of a good reconditioned and highly modified street coupe is this '32 Ford, owned by Russ Aves of San Luis Obispo, California. Painted a passionate purple, under its hood is a potent three-carbureted '55 Chevy V8. Modifications include an Iskenderian E-2

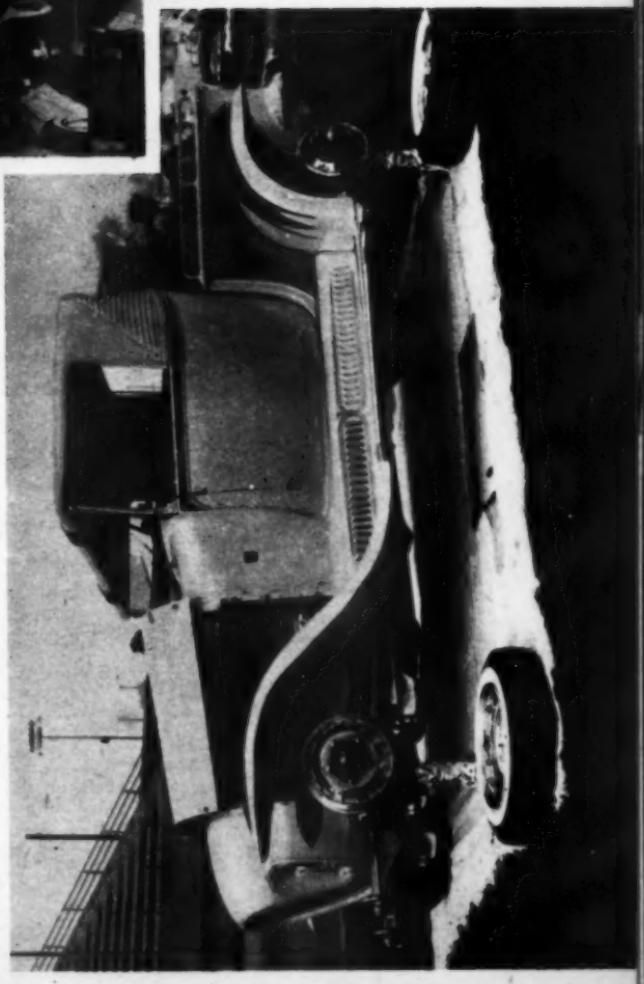
cam, Mallory ignition, bored $3\frac{3}{8}$ inches, stroked $3\frac{1}{8}$ inches. Radiator is cut down and it is channeled at the cowl $2\frac{1}{2}$ inches. Gabriel pistons, metric shocks, chromed wishbones, and a slight rake accomplished by big 8.00x15 rear wheels, 5.90x15 front, give coupe its draggin' look.



BEST

Hardly recognizable as to its origin, this Austin-bodied coupe with its chopped top and blown-head fronted section is a competition machine extraordinary. With Walter Sandoval of Whittier, Calif., behind the wheel, it won the B/Competition Coupe class trophy with a top speed of 109.89 mph at the National Championship Drag at Oklahoma City last fall. A Mailord Automotive entry, it is powered by a highly modified '53 Dodge V8 engine of 259 cubic inches. Multiple carburetors, a hot firing system in the form of Vertex magneto setup, individual exhaust for each cylinder, gave machine excellent performance.





The ultimate in futuristic design in hot rod pickups is incorporated in Dick Peters' new-famous "Ala Kart," built by the ingenious George Barris strictly for show purposes. Winner of the seven-foot trophy on the "World's Most Beautiful Roadster" at the National Rodder show in Oakland, Calif., this futuristic machine features such things as four-coiled air ride suspension system, fuel-injected Dodge full-race engine, micro-electric emergency brake lock, quad four-way head and taillight system, steel, removable and padded aircam top, and the complete undercarriage chrome-plated or upholstered in plated Neugahyde. It's pearl-sheen white and a sweepstakes winner.

AUGUST, 1958

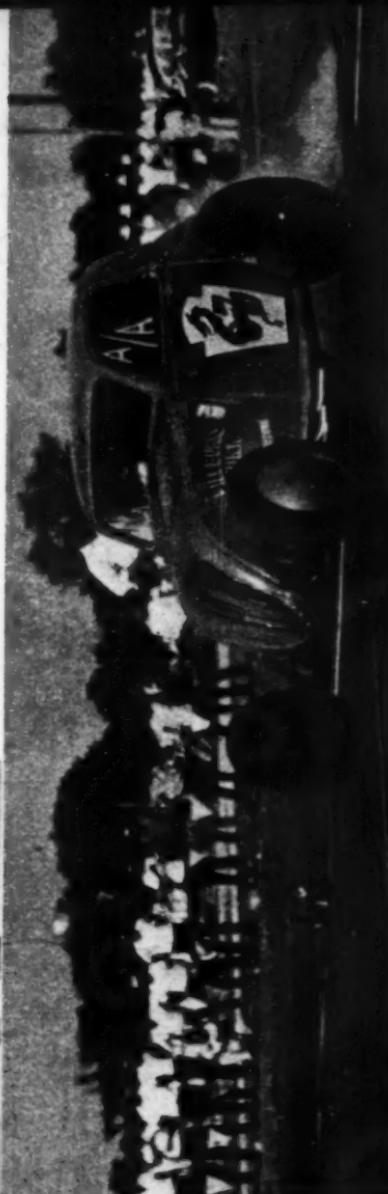
STOM

BEST

One of the hottest cars at the National Championship Drags in Oklahoma City last fall was this Buick-powered Fiat competition coupe, owned by Carl Grimes of Tempe, Arizona. It has an unusual rear-end appearance because of its extremely narrow 40-inch track, which doesn't help stability but apparently is advantageous in getting good tractive power. Though not exactly beautiful, the competition machine walked away with the A/Altered Coupe and Sedan trophy at the Oklahoma event, which is the World Series of drag racing. Operating consistently well at the meet, its top speed was 121.02 mph; E.T. 11.59 seconds.



ROD & CUSTOM • AUGUST, 1958



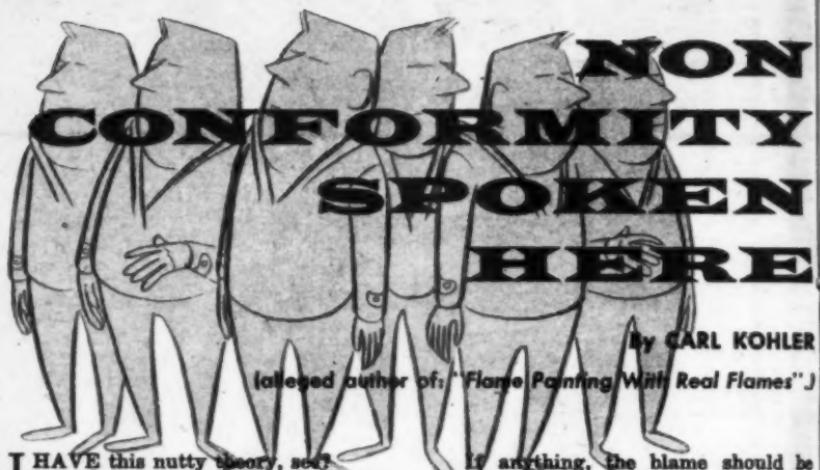
Calif., car's rear end makes a spectacular appearance because of its single-new exhaust stack bent of eight units, one for each cylinder; these were fabricated and designed by Scotty's Motor Shop.

Engine In this engine's front view, note how it is mounted by a revised header. Average of Bonneville, car was driven 202.00 mph in a two-way bodied Class B Lakeside, car was driven 202.00 mph in a two-way average of Bonneville. Details of the fabulous Arden-Marc include multi-point injection system. Maxine Collins, photo. Merchant miller auto parts, sponsor.

Engine in this *dragster* measures 10 inches wide by 10 inches high by 10 inches deep. It has a 4.500 bore and a 3.800 stroke. It is built around a 1967 Ford 351M engine. The engine is mated to a Hurst 4-speed transmission. The engine is topped with a Holley 4-barrel carburetor. The engine is supported by a custom-made frame. The engine is topped with a custom-made hood. The engine is topped with a custom-made hood. The engine is topped with a custom-made hood.

"Cali," our rear end makes a spectacular appearance because of special single-flow exhaust stack bank of eight units, one for each cylinder; these were fabricated and designed by Scotty's Muffler Shop.





I HAVE this nutty theory, see?

According to my theory, all the originality has gradually gone out of the custom car field and has steadily been replaced by a creeping conformity to ideas and designs that lost their novelty and impact, long ago, through usage in every town, hamlet and burg from Yonkers to Pismo Beach.

Almost everyone chops and channels. Almost everybody is addicted to grill-schemes and frenched-light notions of about the same basic patterns. Show me the cat who doesn't really copy, from this source or that, and I'll show you a pedestrian.

And who wears the Blame Badge?

Well, there are those who yawn that the various professional custom car shops are to blame for the lack of fresh designs. This is two-toned nonsense with pleated fringes of absurdity. The majority of the talented men who own and operate custom car shops are veritable whirling dervishes of devotion to the new, the advanced and the unique. It's only good business to produce what their clients demand. No, blaming the professional customizer for turning out dismally stale versions of alleged custom kempis would make about as much sense as pointing the fat, hairy finger of righteous accusation at stores for selling more sirloin-tips than they do hyena-steaks to a public who narrow-mindedly eats beef instead of other meats.

If anything, the blame should be securely pinned onto the sundry individuals whose adherence to conformity is slowly robbing the custom car field of the singular element which put it into existence — namely, *originality*. Today's kemp lover is somewhat afraid to be distinctive in his car planning. He wants to have something mildly similar to what all his buddies are driving. Yet, he also would like to think he's sporting a wagon stunningly novel in its basic design and little touches of garish detail, here and there. This cat obviously, dreams with his eyes wide open: nobody — but nobody can make conventional cake and way-out cupcakes of the same dough.

I say, pufi on the traditional approach to car customizing as it has developed today. Just because Detroit slaps some fresh innovations on their smorgasburgues is no reason for 80% of custom cardom to go ape installing imitative gismos which approximate the Detroit gadgetry — whether it be multiple glove-compartment or dual cigarette lighters. Remember — backyard designers and, later, car shops were lowering their voomwheelers long before Detroit joined the act. That was true customizing. *That*, frents, was the halcyon age of real ingenuity, courage and aversion to hacknied methods.

Recently, I heard rumors concerning the quiet efforts of several gifted zanies who are bravely, industriously

fighting creeping conformity with the old time stubbornness and free wheeling zest of the True Custom Car Enthusiast. Because I know all the backstreets and because I possess more curiosity than tact — I present an outrageously doubtful survey made among this horde of nonconformists...

OMAR FRAPPLE...

A slight, shy type of cat who can best be described as a nervous hooty owl in bib-overalls, Omar was rather reluctant about letting me see his present car project on the grounds that the world is not ready for such practicality blended with truly modern planning.

"Man, this is *fantastic!*" I chirped, staring hard at the unfinished thingie parked in the dim light of the Frapple workshop, a reconverted chicken house. "Where did you ever get the idea?"

"I couldn't ever take my lousy eyes off them fins, see?"

I nodded.

"Everytime a car went by — all's I could ever see was them fins, see? Nuthin' but them lousy fins, see?"

I nodded again, forcing a sympathetic expression.

"Pretty soon, I was seein' them lousy fins on almost every car going by. Stock cars, custom cars, charter buses — all of them was fittted up with them lousy fins, see?"

"And?" I urged him patiently.

"I mean, I had nuthin' but them lousy fins in my head!" Omar laughed hollowly. "Took cold showers, gave up chewing gum and even stayed off the streets. Didn't do no lousy good though, see? First thing I happen to see on TV was this here rocket-ship. And what did it have, see?"

"Fins, naturally."

Omar nodded.



"So I figger them lousy fins is what's gonna be the basic design of tomorrow and the day after that, and the day after that and —"

"So you're building a car based upon the fin," I said.

"That's the lousy truth."

"What will you call it?" I asked.

Omar looked at me as though there was a draft blowing between my ears.

"It's nuthin' but a lousy fin, ain't it? Well, that's what I'm gonna call it, see? A lousy fin, see?"

Untrammeled simplicity: the keynote of the Frapple Fin of tomorrow's custom car design. Watch for it, see?

MANFRED TRINK...

It's a sight easier to describe Manfred Trink than it is to accurately describe his contribution to original custom designing. Manfred, a roly-poly sort of slob wearing the new, highly popular ankle-length Bermuda Longies, was working on his car when I finally vaulted over the 20-foot wall which prevents a morbidly curious public from getting a bug-eyed gander at his brainchild. As I plunged into his working area, I could see, at a glance, Manfred was a jolly type upon whom the cheerfully brash approach worked best.

"Think you've put enough jagged glass on top that wall?" I asked, winking roguishly as I dragged my broken body closer to the Trink creation.

"You're bleeding, aren't you?" chuckled Manfred.

I chuckled appreciatively, too. I forced myself.

"Say, that's an exceptionally interesting . . . uh . . . vehicle you've got there!" I told him. "You've *really* departed from orthodox design!"

"Sure have!" howled Manfred hilariously. "Got the whole notion from that saying about wheels within wheels."

The Trink model was essentially what seemed to be a long oval wheel with everything else constructed inside of it. It appeared to be a masterpiece of balance, although the unusually wide tread apparently was responsible for the steadieness of the . . . uh . . . car.

"Just one wheel, eh?" I observed.

"Certainly!" roared Manfred de-

NON CONFORMITY continued

lightedly. "And it seemed pragmatic to make that one wheel more along the general configuration of a tank-tread rather than sticking to the old, archaic round-type tire!"

"Amazing," I said evenly. "Absolutely amazing."

"That isn't all!" bellowed Manfred hysterically. "See that plump, rotund tire? Guess where the fuel is carried?"

"Pshaw!" I gasped. "Not inside!"

Manfred nodded, dissolving into frantic shrieks of glee.



"Why, compared to the advanced thinking demonstrated in this here now model, it's just no contest!" I avowed.

Leaving Manfred screaming joyously with pride, I painfully clambered over the wall (a stunt I might've thought absolutely impossible, in view of wounds sustained earlier, had not I been inspired for a second try by Manfred's spirited pack of half-starved, viciously bugling hounds who suddenly hurled themselves around a corner of the garage) and once again plunged back into the mundane world of today. I'll have to say one constructive thing for the Trink Tiremobile: It's going to be peachy-keeno for those Freeway lanes that seem to shrink every week.

AMBROSE GRITCHBRIPPER . . .

Undoubtedly, one of the most illuminating experiences I've ever endured began from the moment I stumbled into the vast, modern workshop of Ambrose Gritchripper. To say his place was brightly lit would be a little like describing the Sahara as a sandpile. Blinding white light beat down from row upon row of searchlights to dance,

dazzle, glint and gleam upon the spotlessly immaculate tile flooring. In the midst of all this refractory grandeur I stumbled upon Ambrose solemnly making impressive adjustments upon his invention. At first squint (who could bear a glance under those lights?), the Gritchripper custom seemed to be nothing more, nothing less than an oversized headlight—possibly one with glandular trouble. As my eyes slowly accustomed themselves to the harsh surrounding glare, however—I saw that this craft also had wheels, a passenger and driver area and devilishly clever modifications from the static conceptions of automotive construction. Which is nothing more than a fancy way of saying the thing did kinda look like a car if you peered hard at it with a car in mind.

Ambrose—garbed casually in a shantung loincloth (which was certainly practical, considering the assumed total of, perhaps, some 5,000,000,000,000 watts beneath which he labored) and matching eyeshade—removed his double-lensed shades and favored me with the haughty air of a man who cares little to be interrupted at his work.

"Blow," he instructed in cultured accents. "Beat it."

"Gracious me, but this model is as modern a model as I've ever hoped to see modeled!" I quipped.

"Scram."

"Obviously," I continued, "you're dedicated to outdesigning the multiple-lights boys. And from the looks of this . . . uh . . . marvelously conceived car, you've just about reached the ultimate in headlighting!"

"Evaporate."

I groped my way through the fierce glow to the rear of the model. Here, I could see equally ingenious thought given to the taillight planning.

"A blinking triumph!" I jested.

"Vanish."

Suddenly, Ambrose stalked across the acres of workshop floor to a switchbox. A second later the entire premises were blanketed in total blackness, only the faintly glowing filaments of the myriad lightglobes fading from red to pale orange . . . and then winking out into nothing.

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CUSTOM



"Aw, come on," I pleaded. "Just one more look at it. I won't blab about your design to anybody. Honest injun." I made the scout sign but it was so dark I couldn't even see it myself although my hand was in front of my face.

"Depart," said Ambrose from somewhere in the utter gloom.

I departed, the brilliant custom car of Ambrose Gritchripper still burning clearly in my mind. Somehow, I could not blame him for taking such care to protect his idea against unknown viewers. Boy, if the Karris Brothers ever caught even one glimpse...

SIGMUND TWENGLER...

Lastly, I unearthed the unpretentious shop of Sigmund Twengle, an unfrocked stripper—who having retired on the profits derived from his fiendishly attractive Rust Decals—was now engrossed in experimentation of the most elaborate and abstract approach to custom cars ever known. I found Sigmund lustily wielding his own version of a spraygun upon what appeared to be a wooden mockup of a reasonably conventional custom kemp.

"What goes?" I inquired.

"My own formula," Sigmund informed me tersely, keeping his eye on the billowing clouds of paint. "Took me almost nine years of refining the other formulae, but I think I've finally cut the mustard, dad!"

"What's this formula based on?" I asked.

"Cut mustard, dad."

Slowly the undulating clouds of spray settled upon the wooden mockup

and began hardening to a glossy glaze. Before my astonished eyes that stuff actually coagulated. I turned, blanching whitley, to Twengle.

"Ye gods, what a formula!" I bleeped unbelievably.

"Yeh, man!" Sigmund's paint spattered face wreathed in a happy grin. "I spent almost ten years working down the wrong track. Tried getting the same results with a derivative squoze outta Instant Gin combined with household detergent and just a dash of nitro. Almost blew East Los Angeles clear into South San Bernardino. Didn't quit though. Kept on trying, kept on staying in there mixing until I finally cut the old mustard!"

"Cut it with what?" I demanded.

"Instant Chicken Fat. Works like a charm. I strain the color desired from ordinary housepaint. Watch, now!"

Sigmund thumped the hardened coat of paint with a skilled finger, got a firm grip on it and lifted the entire 'paint job off the mockup!'



"About fifty-three coats of this jazz — set it on any good frame, add wheels and, dad, there's a custom car!" said Sigmund carting the paint-job away.

I left, still rubbing my eyes.

... and thus ends our guided tour of several new schools of endeavor in truly modern car customizing. Perhaps you know of similar cats whose uncluttered thinking will be responsible for whatever startlingly unconventional cars grace the roads and byways of the future. For that matter, perhaps you are one of these giants of design.

If so, rest assured I'll keep my mouth shut, old buddy, while you're busy helping to stamp out conformity. •

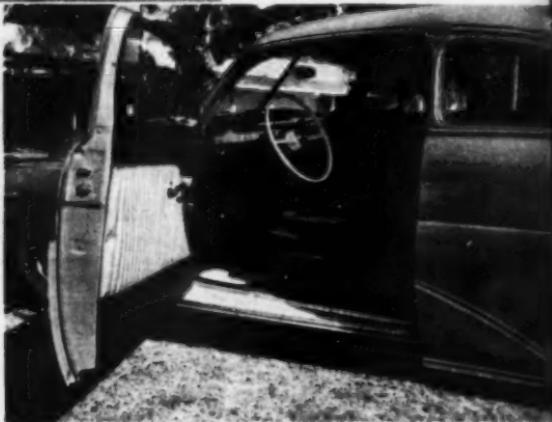


...and Merc glitters and glows

THE

By JIM POTTER

To simplify front-end, three horizontal bars are floated in custom-molded grille shell; then the front bumper pan was molded in, the bumper itself smoothed of all attachment bolts and guards removed. Black scalloping emphasizes the twin aircoops on the lower forward edges of the hood. Black and gold leatherette dress up interior with pleats and rolls.



A different installation of Packard taillights gives appearance of a heart when viewed at a certain angle. Lenses are inverted together.

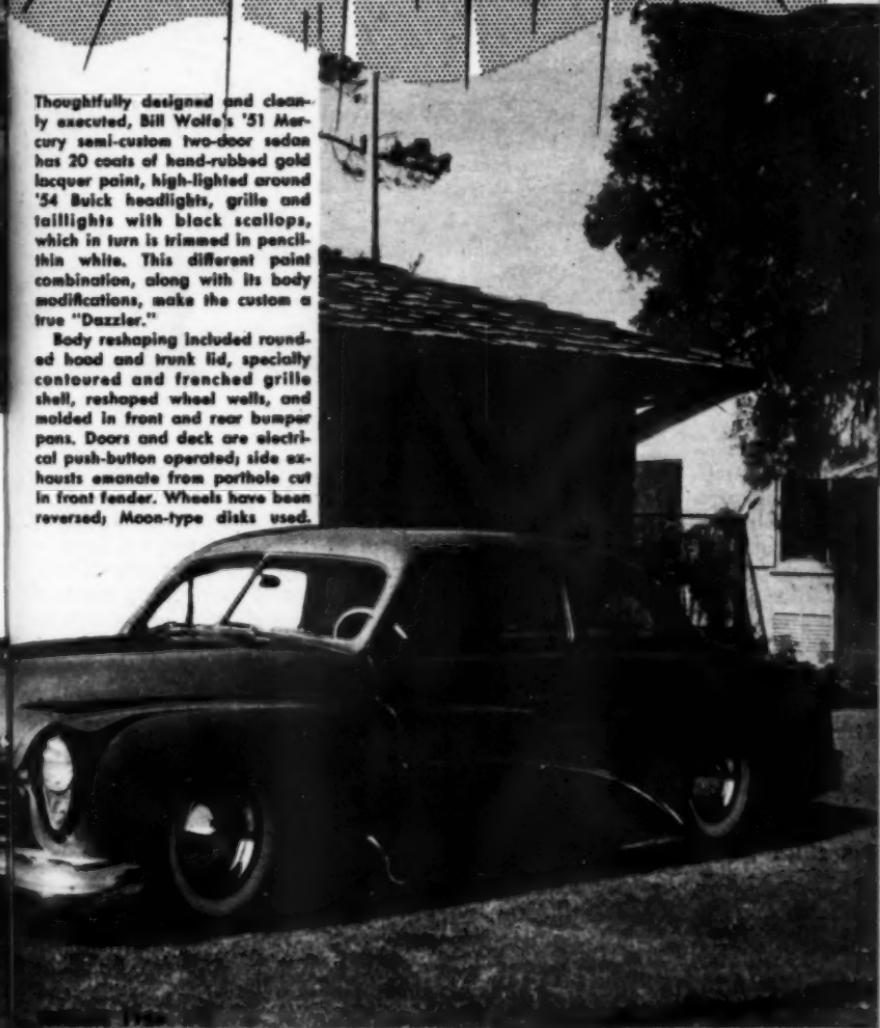


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DAZZLER

Thoughtfully designed and cleanly executed, Bill Wolfe's '51 Mercury semi-custom two-door sedan has 20 coats of hand-rubbed gold lacquer paint, high-lighted around '54 Buick headlights, grille and taillights with black scallops, which in turn is trimmed in pencil-thin white. This different paint combination, along with its body modifications, make the custom a true "Dazzler."

Body reshaping included rounded hood and trunk lid, specially contoured and frenched grille shell, reshaped wheel wells, and molded in front and rear bumper pons. Doors and deck are electrical push-button operated; side exhausts emanate from port-hole cut in front fender. Wheels have been reversed; Moon-type disks used.



the full story on—

TOP C

no easy job, roof lowering calls for far more work—



DID YOU EVER try to fit together the remaining halves of an ice cream cone after a horizontal section had been taken from its center? That precisely is the problem you'll run up against when you plunge headlong into one of the more radical customizing practices: top chopping. Luckily, though, body metal can be successfully shaved around — unlike the cone — until the halves are reunited. But this takes a heap of doing, and those of you not formerly exposed to an operation of this nature had better rein up long enough for us to brief you on the pitfalls that lie ahead.

The best way we can get over to you the idea that top chopping involves more than merely slicing the top off your car, hacking away a couple of inches from the vertical posts, then rewelding the upper half back on again, is to ask that you obtain a photo of an automobile. Make it a side view, if you will, and either cut it out of the paper or a magazine ad. Now with scissors, cut horizontally right through the car just above the window sills. Then make another cut a little above the first to represent metal removed. Now does the upper half align with the bottom?

And there, in a nutshell, lie the complexities of top chopping.

Not since the days of the Model A have cars been constructed with vertical window pillars all around. Styling demands sloped windshields and tapering roof lines. And this is where roof lowering starts and ends.

P CHOPPING

and expense—than meets the eye



But to take it from the beginning, turn the page ...

Photos by Boris



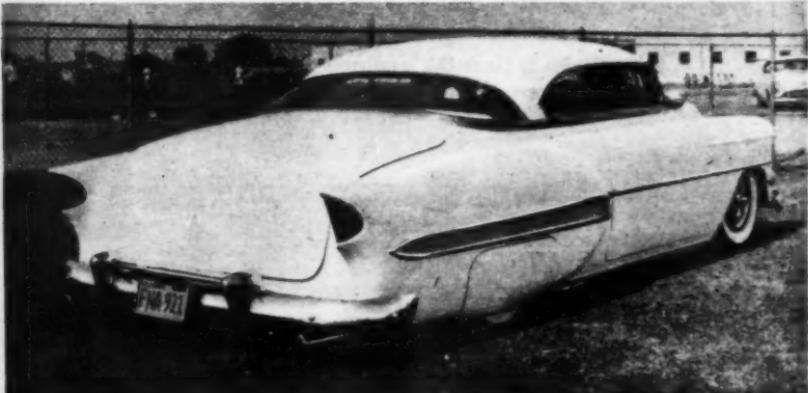
TOP CHOPPING

what you should know and what to look for before taking the hacksaw

THOUGH the basic procedures for chopping a top are generally the same for all makes and models of cars, various body types and differing construction methods mean that the details involved will vary slightly between one car and the next. Fundamentally, though, there are six types of bodies to contend with; pickup trucks, hardtops and coupes (or sedans) — with both early and late versions of these three. (Convertibles are omitted since it is not within the scope of this story to discuss the steps involved for chopping non-metal tops).

The path to a successfully chopped top is a narrow one. In short there is a certain order in which the steps must be taken. First, and foremost, let's assume that your car can stand chopping without harming its overall styling. Most cars are blessed with an overabundance of roof height and can take a three or four inch reduction.

All body types are equally adaptable to top chopping, but some will lose their original design appeal unless discretion is used. Here is a tastefully done job on a 1954 Chevy hardtop which still retains its original inherent good looks, but is far lower. Note the reduced rear window height.





align windshield posts
to your car



align center post



split top-align windshield and
rear top supports

could as long as he was doing the job, and wound up with a grotesque looking machine that defies clear driver vision. Discretion at the beginning could have saved him lots of discomfort later.

Three and a half or four inches is a pretty sizeable chunk to hack from a windshield. You can get an idea by covering the upper four inches of your glass area. Some roof lines actually slope upward toward the rear (to clear the heads of rear seat passengers) so in a few cases slightly more can be cut from the rear of the top than from the front.

Many chop jobs have been ruined by mis-measurement where the owner intended to remove only a moderate amount of top height, but who wound up trying to equalize the amount cut from each post because he erred with

There are three general ways in which a car's severed top can be reunited with the bottom. Example at top illustrates alignment of windshield posts, but center post will need realignment and great deal reshaping will be necessary around the rear window. Center example shows alignment of center post, with some realignment needed at the windshield posts and a bit of shaping near the back window. Bottom example shows alignment of both windshield posts and rear of top, but top has to be split longitudinally and strip of metal added (since turreted top has actually become longer). Each method can be adapted to the chopping of late model steel-topped cars. Of specific importance is reinstallation of rear glass. Most back window glass cannot be cut down, so a plastic substitute must be formed, or stock rear window opening is retained and glass leaned forward at a greater angle (see text for complete explanation).

the measuring tape. (Much like leveling a table by cutting the bottom off first one leg, then another, and so on). *Don't forget to make all measurements vertically!* If you're set on cutting, say, four inches from your top, then more than four inches will have to come out of the windshield post as measured along its slant.

There are a variety of ways to reef the severed top back onto the body after the required amount has been cut from all vertical members. As pointed out previously, the posts will not align due to their slant so the difference has to be made up somewhere. The top can be rejoined with the center posts aligned and with the windshield posts and rear top sections needing reshaping; or the top can be fitted with the windshield posts aligned and all the

TOP CHOPPING

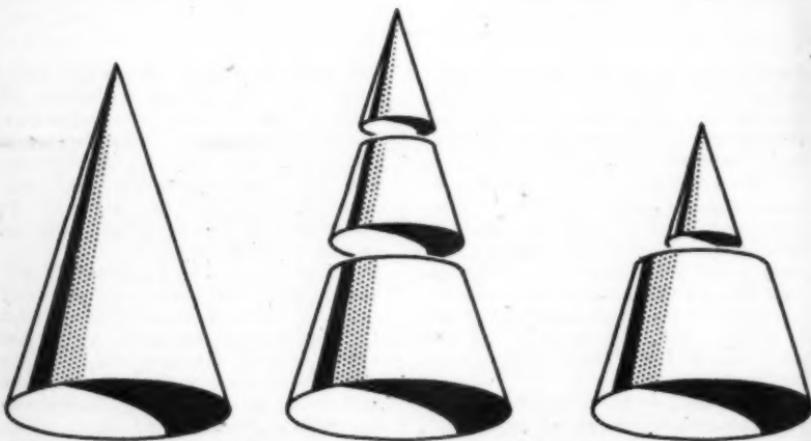
continued

difference in top length being made up at the rear window area; or the top can be split longitudinally, the fore and aft posts aligned and the resulting gap across the top filled with a strip of metal. Each of the methods are illustrated.

In the case of cars built since 1946, rear window glass cannot be cut down due to the very nature of this specially formed glass. Therefore, an oft-referred to solution is to use sheet Plexiglass, heated and bent to conform to the shape required. In other cases it may be possible, when chopping the top, to retain the stock-size rear window and obtain the necessary lower roof lines by sloping the rear glass forward. One of the latter cases is illustrated in the how-to-do-it on chopping a '51 Mercury top in this issue. On pickups and other cars where the

rear glass is flat, cardboard templates can be made of the finished window opening and a glass shop will be glad to cut a piece from a sheet.

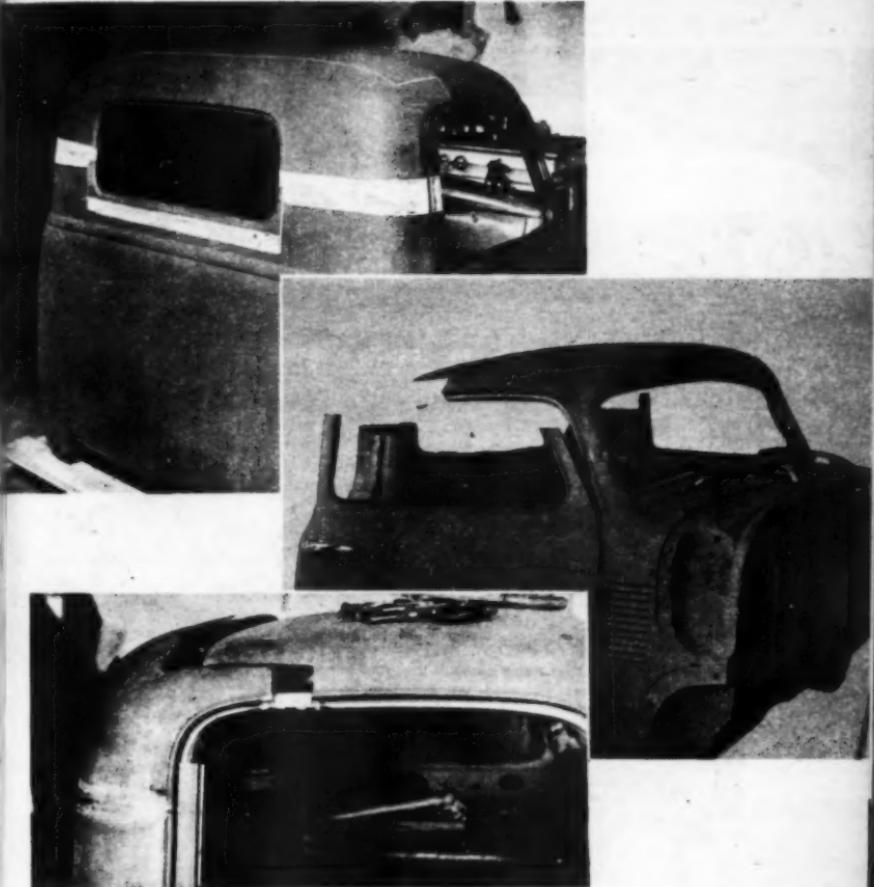
Above and beyond the major problems already discussed are the thousand and one details which the customizer will encounter as he drops the roof of his car to its new, lower height. Foremost, no doubt, is the actual metal working procedures. The welding, hammer-and-dollying, pecking, stretching and shrinking, leading and, finally, filing, are steps not to be taken by the amateur. The best we can do in the space allotted is to warn would-be choppers who have not had considerable experience along these lines to stand back and let the professionals do the work. The turret top of a car is no place for a novice since, among other things, the heat of care-



A graphic illustration of why chopping requires such extensive metalwork. Car tops are tapered like a cone (left). When a section is removed through the middle (center), the top and bottom halves no longer match up (right). Obviously, radical rework is needed here to re-fit sections together again.

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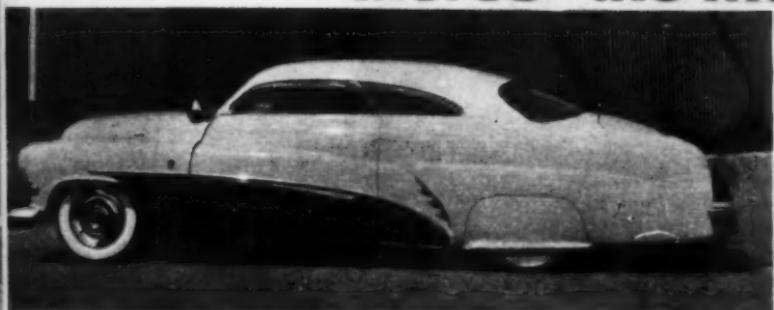
Three stages during the chopping of the R & C Dream Truck. First the $3\frac{1}{2}$ inches to be removed were marked with a scribe and the area to come out chalked for photographic purposes. Note that not all the height reduction is to come from the rear window. Only $2\frac{1}{2}$ inches came out of the glass area while the remainder was taken below the window to minimize vision impairment. The second photo was taken as the front half of the top was being replaced. This top was split longitudinally so rear panels and windshield posts would align. The third photo shows the gap across the top which was later filled with a strip of metal. Jig was made in cut so advantage could be taken of the added metal strength near the rear crown of the top. The upper door posts were cut later on.

less welding can cause such a sizeable steel panel to warp and buckle into irreparable condition.

But now we'll let you encounter an actual roof-chopping procedure. Two

of them, in fact, which should pretty well round out the problems involved when performing the necessary surgery on any of the numerous body types adaptable to top chopping.

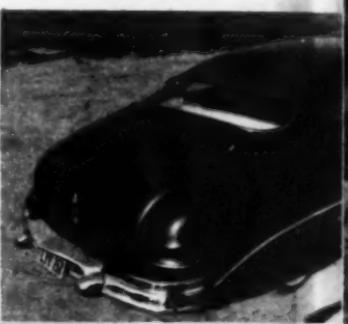
Merks - the most



'51 was given hardtop look by building the side glass frame from curved sheet metal.

TOP

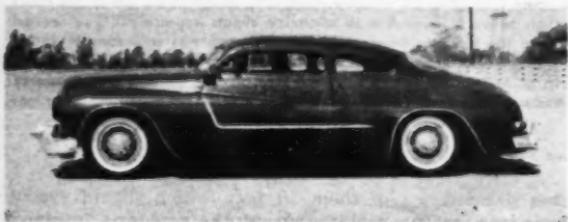
Most chopped Merks retain stock rear windows. Following pages reveal how this is accomplished.



Degree of slope to roof helps conceal the true identity of this Marc chopped top example.



Stock size rear glass from a '4



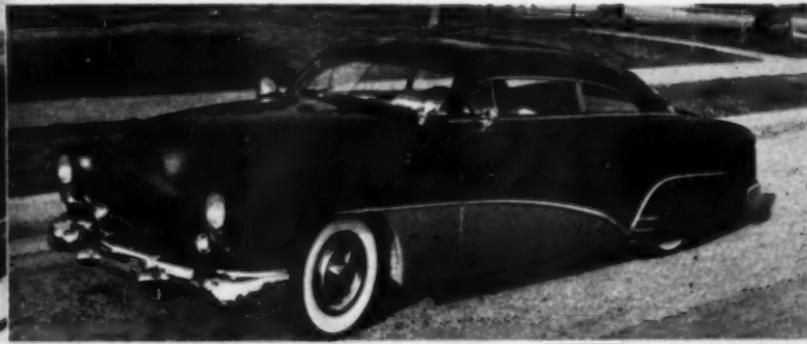
Centerpost was retained on this example and kept vertical, instead of being leaned ahead.



st popularly chopped cars

TOP CHOPPING

THE '49-'51 Mercury is without a doubt the most popularly chopped post-war car. Its basic design permits chopping without loss of good proportion and the variety of ways in which the side window treatment can be handled practically assures that no two of them will be lookalikes. Here are just a few of the numerous chopped Mercs — and if this fires you to the point of wanting to hack into your own Mercury, then a flip of the page will show you what the procedure involves.



Another Merc with hardtop appearance, though $\frac{1}{4}$ -window post is vertical. Note V-d windshield.

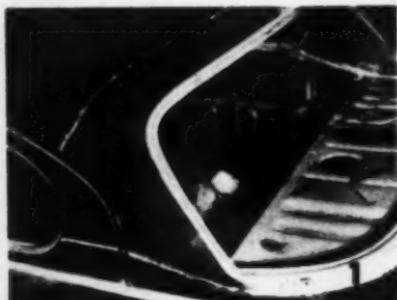
car glass from a '49 was used on this chopped '51. Door posts slant ahead. Drip rails removed.



TOP CHOPPING

... how-to-do-it on a Merc

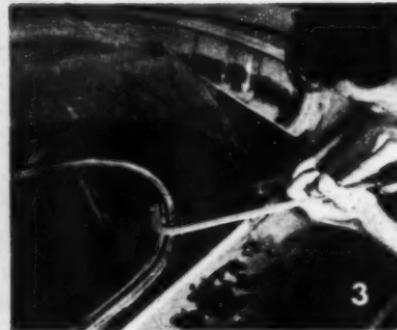
PHOTOS ON THE preceding pages attest to the popularity of chopped top Mercurys — especially those incorporating the '49-'51 styling. So though we don't expect all Merc owners to rush out with hacksaw in hand and begin whittling away at their pride and joy, here is a look at what roof lowering on this car involves. Warning: Leave the job to a competent metalman. These photos will show how involved the job can get and, we hope, scare off the novice who might otherwise discover — too late — that he has bitten off more than he can chew.



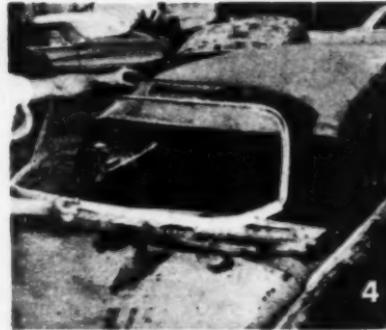
Important first step in top chopping is to strip the car of all glass, rubber and metal trim, inner moldings and upholstery. Then marks are made where cutting will be done.



The vertical center, or "B", post is cut completely out with a hacksaw. It can be discarded if hardtop appearance is wanted, or it can be replaced as will be done on this Mercury.



More hacksawing. This time rear of the top is severed from the body, though cut does not continue through to rear window opening as will be explained later on. Glass frame . . .



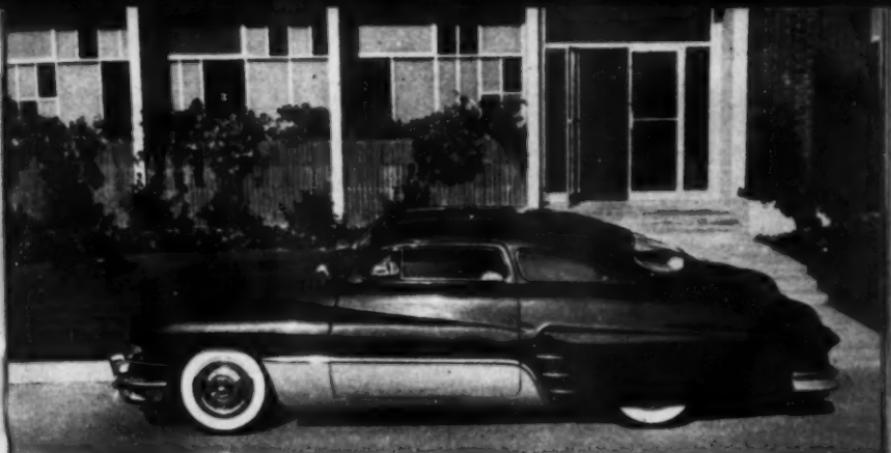
. . . is removed in its entirety. Since the rear glass cannot be cut down, stock-size frame must be retained. Thus, to achieve a lower roof line the section must be leaned forward.

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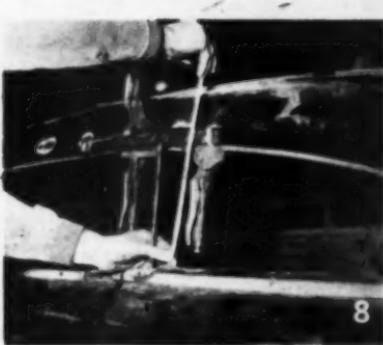
Finally the windshield, or "A", posts are cut. This top is being dropped about three inches, but post measurement is more than this measured along the slant. 3" is the vertical chop.



Heave ho! and the Merc is scalped. Though parallel scribe lines denoting the cuts were made on all posts, only the upper lines were followed with saw. With the top off, lower ...



...cuts are made. Though not necessary on all cars, this Merc's top was also cut along drip molding line. Here careful measurement is taken before tackwelding top back in place.



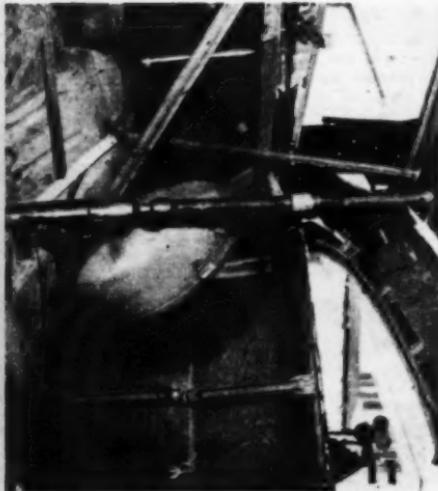
More measurements. Importance of this cannot be overstressed — unless you want a lopsided top! Check heights at several points around the car before welding permanently.



Tackwelds hold top as centerpost is placed. Because top went forward so the "A" posts would align, the "B" posts must be slanted forward as shown to conform to new angle.



Windshield posts are welded after diagonal measurement through glass opening assures that the top sits absolutely square. Note the jack inside car holding the top in alignment.



Around back things are a bit more complicated. Even with roof replaced, 3" height has not been cut from the roof panel. Glass frame is set into opening at desired angle...



...and overlapped metal is cut away until frame fits the hole. Then after tackwelding solid weld is followed by alternately heating and hammering bead to ease later metalwork.



Follow procedure until all seams are done. Note in this photo the seam running clear across the car's top denoting where the glass frame was removed in its entirety from car.



Top has to be split forward and aft from the longitudinal cut so the metal could be pulled to shape required by new positioning of the glass frame. Top is now ready for the final ...



... metalwork and cautious lead use. It was decided on Merc shown to join the upper door frame to top so car would appear as a semi-hardtop. Here the "A" post is being leaded.

AUGUST, 1958



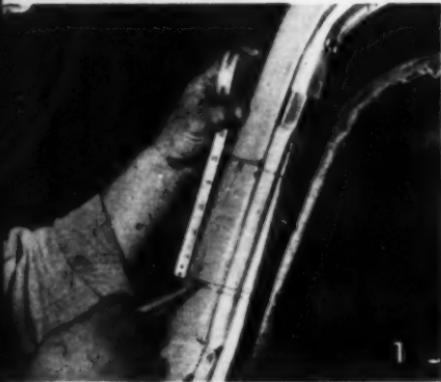
Block sanding between the successive coats of primer will smooth imperfections remaining after the metalwork. Top chopping should not be attempted by novices—a word of warning!

TOP CHOPPING

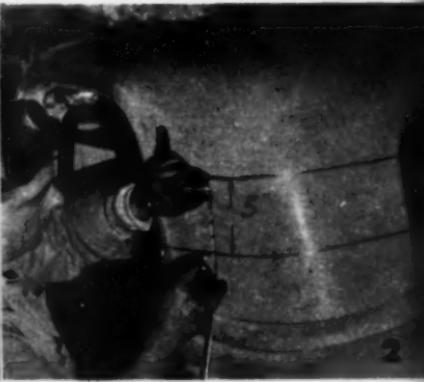
the older

THOUGH the Merc shown on previous pages is perhaps the most popular single model for chopping, by far the greater number of chop jobs are done on cars built during the '30's. The larger percentage of these are, of course, whittled down to present less

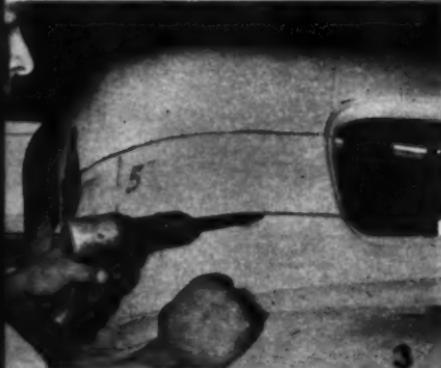
frontal area thus aiding them in their competition quests, while the rest are, like their later model counterparts, intended for street use. The comparative ease with which these early models can be hacked down, plus the fact that most are blessed with an overabund-



Early models can lose as much as half of their post height without impairing driver's vision. This car, intended for street use, has been stripped and marked for a 5" chop job.



Rear of top is marked where rear of top and door posts are closest to true vertical thus easing later metalwork. Cut lines must be as nearly parallel as possible, an obvious point.



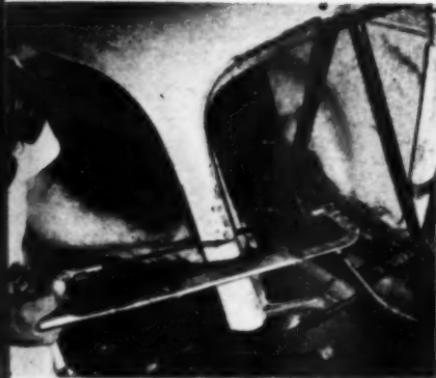
Hacksaw cannot span cut distance, so an air-operated chisel is used. The cut is best made just short of scribed line and a body grinder used to bring the cut to a precision edge.



With rear top sections removed, amount of this chop job is easily apparent. Before deciding extent of top chop, check with local authorities to learn minimum windshield size.

cars— for competition or street

ance of headroom, are the factors making pre-war cars those most often made to undergo top chopping. The '34 illustrated should serve as a guide to the steps required to reduce the top height of most older cars.



Five inches of windshield height, (measured vertically), are then cut. Another cut part way through posts will be made so that the post can be bent to conform to the angle needed.

Once the cut edges have been sized with a body grinder, top is set back onto the lower part of the body. Note that rollbar inside coupe was built to conform to new top height.



Measuring tape assures that top is accurately situated before welding begins. In comparison to chopped Merc shown earlier, this top was moved back so rear of the top is aligned.

Alternately welding seams and hammering to keep unwelded halves aligned, Barris continues on around the top. "Boxy" shape of older cars accounts for chopping popularity.

amount of
store de-
with local
field size.
CUSTOM



Leading edge of top has been moved aft about $1\frac{1}{2}$ inches, so windshield posts must be reshaped to conform to angle. Severed section has been replaced here and upper joint . . .



. . . welded before the lower one. Bottom edge is to have a flared appearance when finished, so piece of metal is added to the car's cowl. The doors, removed during top chopping . . .



. . . are now replaced, marked and cut accordingly. Marks were made as close to vertical portion of posts as possible to ease alignment. Front door post gets greatest reshaping.



Rear door post goes together with door on car. Fit can be closely checked during the steps by closing the door and visually seeing its alignment with surrounding body panels.

10

edge
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12

door on
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CUSTOM



13

Once all seams have been welded and majority of heat-buckled warps hammered out, steps prior to necessary leading are begun. Here welds are carefully cleaned of dirt and scale.



14

With area cleaned and tinned with special compound, stick of lead is heated to semi-fluidity and paddled over the welded seam. More than enough lead is added so that...



15

...when excess is ground off the surface is as smooth as it was originally. Pressure on the grinder should be light when grinding lead as it tends to be quickly ground away.



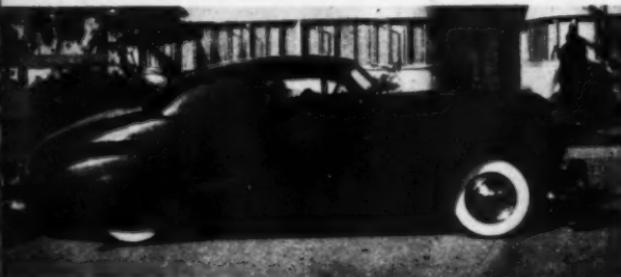
16

Finally, edges are trued with a small, curved file. Next will come heavy priming, sanding with paper rubber block-backed, the fitting of glass. See cover for photo of finished car.

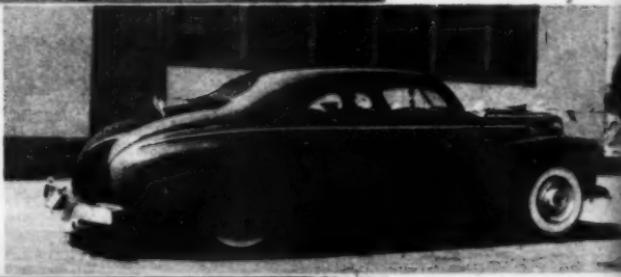
TOP CHOPPING

all makes,

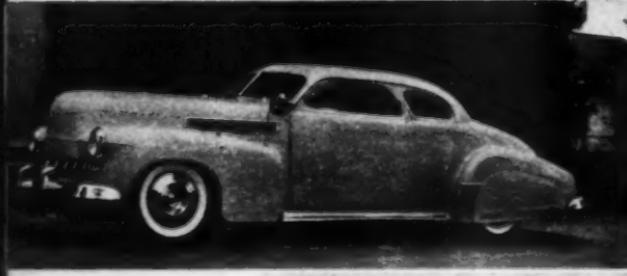
are equally adaptable to chopping.



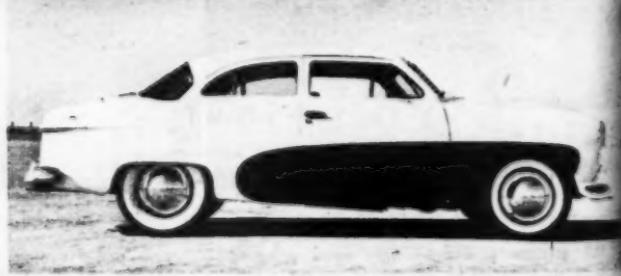
1941 Buick coupe not only has emerged from chopping operation, but has lost $\frac{1}{4}$ -windows.



Fords from '41-'48 are another popular car for chopping. Here's a fine example of chopping.



Nothing escapes chopper's saw. Early Cod is the victim of chopping, but is well done.



This Ford was chopped, but uses full-size wrap-around rear window from a later model car.

models and body styles

here are a few of the more tasteful examples

Ford 2-door was turned
into a hardtop during
chopping by welding
upper door posts to top.



1957 Ranchero, with a
vertical rear window, is
easier to cut down than
a coupe or a sedan.



Case where rear win-
dow was made smaller
instead of leaning stock
one forward a little.



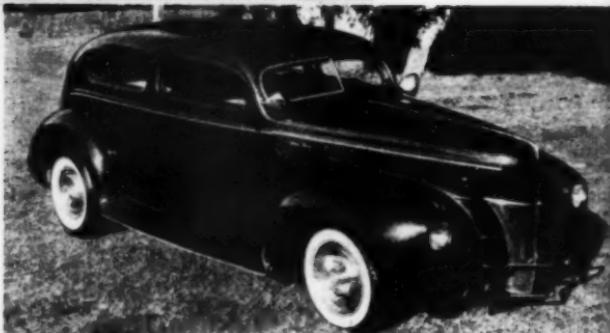
Ford convertible has a
chopped windshield, an
equally-cut Victoria top
permanently installed.



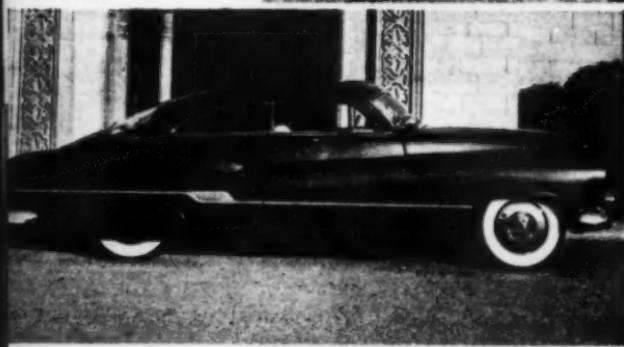
TOP CHOPPING



Popular chopped Ford.
Rear window of plastic
has aided the custom-
ary glass fitting hassle.



Coupes aren't the only
chopping bait. This '40
2-door is shown in color
on this month's cover.



Someone once said
GM's fastback design
could not be chopped,
so Barris did it anyway!

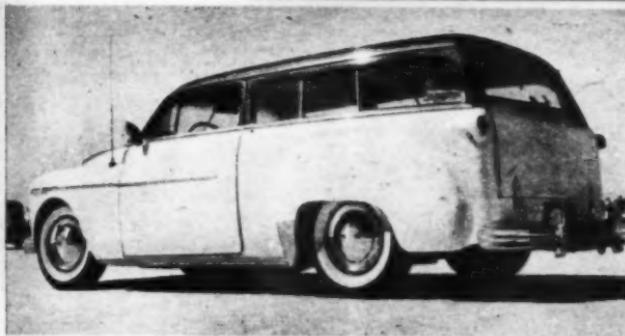


Here's proof that even
4-door models cannot
escape the customizer
wanting low roof lines.

Ford.
plastic
custom-
hassle.

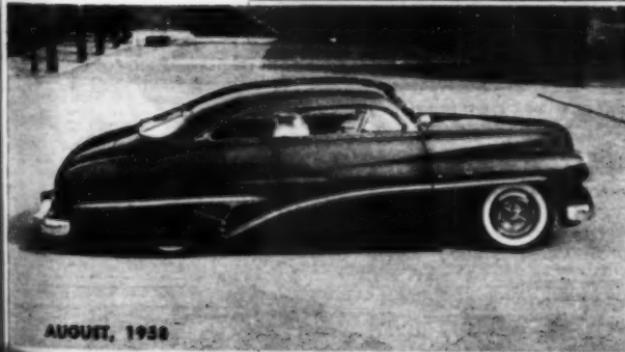
continued

A rarity. Merc wagon's top was chopped above the window line for the pancake-top look.



Chopped Plymouth wagon. No panel-beating here, but lots and lots of post-stretching.

'49 Chevy coupe underwent surgery for lower roof lines, and has 1-piece Olds windshield.



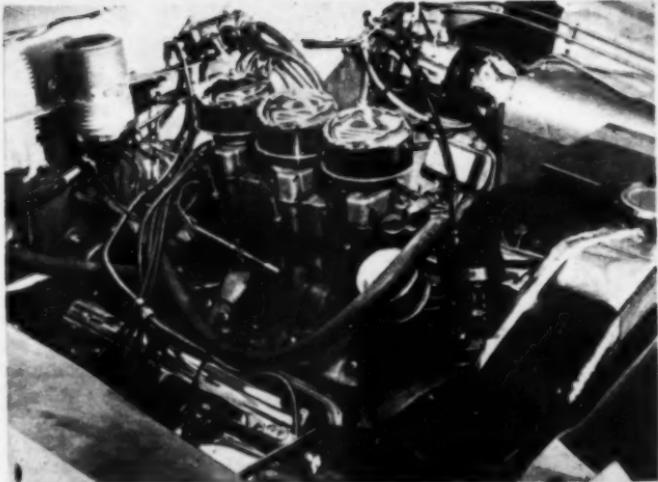
Summing up with yet another Merc. Convertible doors were used in this pillarless hardtop.

FURY-IZED FORD

a Plymouth powerplant lies beneath paneled hood



By DON McCLURE





Pancaked hood of Earl Clausen's unusual '50 Ford conceals engine which once powered a Plymouth Fury. Royal Blue and Green Lime paint treatment emphasizes the hood scoop and unique grille. Chevy headlights and reworked DeSoto bumper with nerf bar-like grille guard complete the frontal restyling of Bend, Ore., custom.

Lower deck section was severed and molded to body giving truck a pancaked effect matching hood. Neat peak has been lightly scalloped, then white-edged. Rear bumper is, like front one, from a DeSoto, and has through-exhausts. The deeply tunneled taillights are emphasized by clever use of paint. Pressure on deck lid opens doors.



Neat-as-a-pin interior has fully pleated door panels and striped headliner with pleats in diamond shape. The Blue and Lime Green shades match exactly the exterior paint. All metallic items not upholstered have been chromed. The exposed exhaust, leading from beneath the doors, is capped for street use but unplugged for Sunday drags at which the striking Ford is a consistent contender. The dash features a new housing grouping of instruments for checking engine conditions.



Customizing for SPEED

IN THE JULY issue of R & C, author Ted Gondert gave us the illustrated tour of how to more effectively streamline a car while customizing. In this, the second part of the story, we encounter a subject equally important which is too often glossed over, if considered at all. Once you have achieved an effective design to maintain a satisfactory air flow, jump on to step two, which may be likened to putting a tail on your kite.

HOW EFFECTIVE your present design is in maintaining a good air flow, conveyed smoothly to the rear of the car, can frequently be seen in the dirt pattern after driving in the rain. Of course, the speed should have been reasonably high, say 50 or 60 mph. Try to observe the pattern just after stopping. Sometimes a clearly defined line is drawn across the roof where the flow separates from the body. You know then what shape the flow will follow. All you have to do is reproduce this slope in metal, fiberglass or plastic. For those residents of the northern parts of the United States, an excellent form can be gleaned from the carving away by the wind of a heavy layer of snow on the car. This is probably one of the best methods of streamlining, as the air does it for you. The only problem lies in a piece of road suitable for some 50 mph after a heavy snow storm.

The only thing left to do now is stabilize the car. But first, what is stability? The stable car should be unaffected by sidewinds. That is, no driver correction is required at any

speed. This is quite difficult to attain in practice and the goal should be a sort of practical stability where the corrections required are so small you wouldn't notice them. A striking feature of a practically stable car is that you can't really tell from which side the wind is blowing.

The requirements of stability are simple. The CG must be ahead of the midpoint and the Apparent Center of Pressure (ACP) must be between the CG and the midpoint.

The ACP is the point that must be brought into line if we are to have our stable car so let's see what it is and then what can be done about it.

The ACP is determined by dividing the moment on the car, due to a side wind, by the side force. Not a particularly difficult concept until you investigate a very streamlined body. Here the ACP can act ahead of the body, which is a little difficult to see. To see how this happens let us consider a streamlined body with air flowing over it at some small angle, 5 or 10°. This wind exerts a force at the front of the car, in the direction of the wind, of say 100 lbs. Then comes the joker. It also exerts a force at the rear, in an opposite direction of say 50 lbs. As far as the moment goes the two forces add and if we take a 20-foot car length the moment about the middle is 1500 ft-lbs. But the forces themselves, since they are in opposite directions, tend to cancel each other so we have a measured force of 50 lbs. If we simply divide the moment by the force to get ACP

and

STABILITY

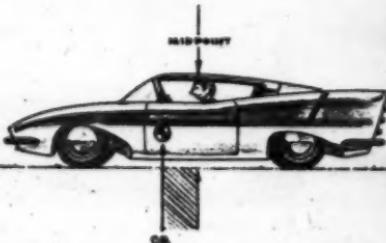
By T. R. GONDERT

we have $\frac{1500 \text{ ft-lbs.}}{50 \text{ lbs.}} = 30 \text{ ft.}$ or the

ACP is 30 feet forward of the midpoint, 20 feet ahead of the car. This will serve to illustrate simply I hope, how the Apparent Center of Pressure can be ahead of the car.

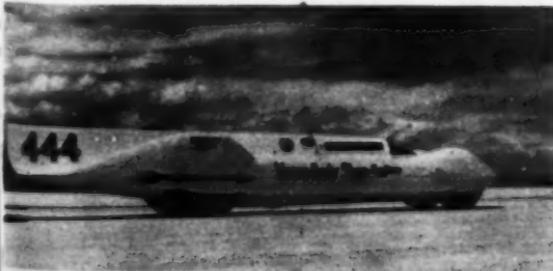
In our stable car we want the ACP at the midpoint or there about, so we simply add a fin to produce a force at the rear. In our example, we could eliminate all moments by a tail fin producing a force in the direction of the wind, of 150 lbs. at the rear. This still leaves us with a 200 lb. force but the tires can take care of that. In practice, the effect of the tail fins, if correctly designed, is to yaw the car into the wind producing a tire side force equal to the wind force. Since the forces chosen are quite high, the tires can handle the actual forces rather easily.

And now to get that force at the rear we add a tail fin. Unfortunately, these get rather large and work best if mounted on the roof. It can be done without having to lower the fins for underpasses but don't expect much



Drawing above shows the relationship of the center of gravity to the midpoint of a proposed design which follows the principles as set down in the article. In order to achieve a stable vehicle, Apparent Center of Pressure must fall between CG and midpoint (shaded area). Fins do the trick, as without them, ACP would be far in front of car.

from a pair of fins even the size of those on the Dodge. The following approximate size, as a pair, proved to be satisfactory in a model investigation of a streamlined Studebaker. As these are quite long, they are slotted at about 45° from the outside in.



The Vesco-Dinkins four-burrelled streamliner which previewed at 1957 Bonneville Speed Trials uses a long, low approach to the finned for stability idea. Car proved to be extremely solid-worth despite its very narrow tread which gained it the nickname of "The FOUR-WHEELED MOTORCYCLE".

Customizing

for SPEED and

STABILITY

continued

The fin principle can be adopted to current popular cars in a very tasteful manner as shown by Marvin Lee's '57 Plymouth, below. Car had Dodge fins grafted onto Plymouth fenders. Comparison may be seen with stock model at the left. Car's design is very good.



This fin shape, low and long and slotted, seems to be the best for any road car. Over 200 mph, the high, thin, fin may be better. The present fin, low and long, provides for a much greater range of resultant wind angle. This is the angle obtained by adding the direction of the wind to the direction of travel and with a travel speed of 200 mph and up, the resultant wind will always be at a small angle, less than 10°, in any wind within reason. On a road car, however, even 30° is quite possible. For this reason more latitude is necessary in the road car.

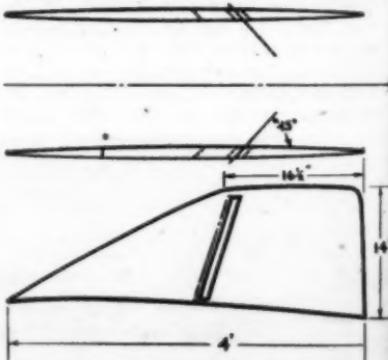
Herde streamliner goes the tall fin route. Car is excellently prepared and underwent many wind tunnel tests before being constructed.



A second important consideration is that the long, low fin fits the design of an automobile better.

For the record car, the high, thin fin is more effective per square foot of area and should show less drag than an equivalent long and low fin.

To determine if you have stability, drive the car in still air and then into a side wind. There should be no steering corrections required. You could run through a tunnel or a cut into a flat area to get this effect. The steering could be fixed by attaching a light stick to the wheel and to the window



ROD & CUSTOM

current
er as
below.
mouth
stock
good.



Chrysler Dart with Ghia-built body was exhibited by author as the idea to strive for in last month's introductory instalment. Streamlining is evident and the fins are proportionately designed. Note the resemblance to Lee's custom Plymouth in photo at left. Rumors from Detroit hint that fins will be getting larger and start moving forward next year.

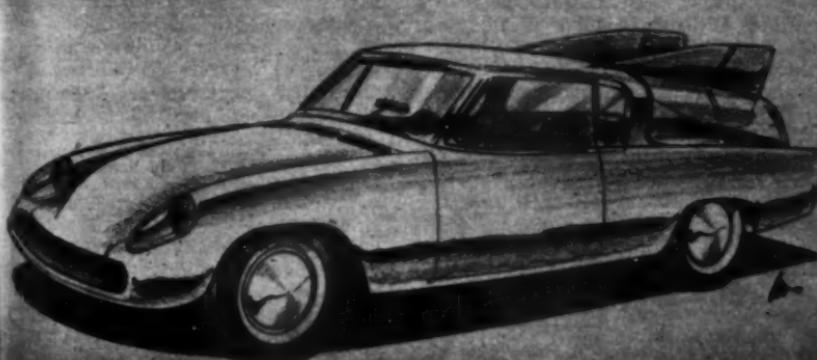
sill or you could lock the wheel with your knees. The point is there should be no correction necessary.

There is another method of testing using the steering wheel, you jerk it

and return it to zero, but the response behavior of a car is such that it's very hard to analyze. I could describe it in detail but it does get complex.

That about covers it — have fun. •

The drawing below was made by Graphics Editor Lynn Winslund from photographs of a model '53 Studebaker Coupe which the author used in some exhaustive tests on stabilizing a common passenger automobile. The car's top was extended rearward to follow the K-form principle as outlined in last month's article, and fins placed atop the roof to stabilize the car. Actually this location is better than the fenders because of the undisturbed flow. A drag coefficient of .23 was obtained — about half that of the average car. The scale drawing at the left, below, shows the size of the fins used in the experiments and the slot locations and angles. Experiments on the part of the individuals will show the size and shape that is the most suitable for their particular make.



*Heading for the salt flats this year?
Here's how...*

BONNEVILLE

YOU can do more than dream about breaking speed records. The Bonneville Nationals coming up in late August are made to order for the backyard amateur to cover himself with glory and write his name in an official record book — without spending every dime he's got to do it. I know many, many fellows have told me how they would dearly love to break a speed record; many would even be willing to spend considerable time, sweat, and money to do it. But they seem to think that all the Bonneville and Daytona class records are way out of sight — no possibilities for a greenhorn to step in and take over.

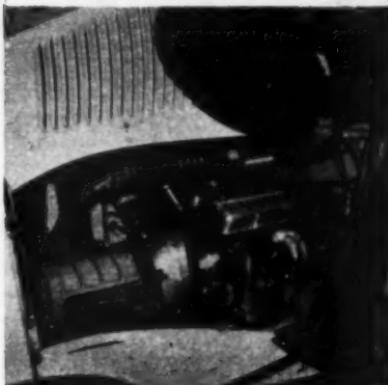
It just isn't true. I'm not going to say all these standing records would be a pushover, or that any of them would be. But whenever you have a large number of separate classes and subclasses in a competition event there are bound to be certain divisions that are less popular with the fellows — more or less neglected by the run-of-the-mill, you might say. Competition is not so rough here. Chances are the records standing in those classes did not require the ultimate in body and chassis design, horsepower per cubic inch, etc. Here's where you can make hay.

The big problem is picking the target. I'm thinking that the reason many

of you fellows aren't recognizing the possibilities is that it's difficult for you to mentally picture speed against cubic inches and body type. To say that C Gas Roadster did 146 mph on 302 cu.in. doesn't give any hint as to how much engineering went into the record car. But if we could say that the record speed required, say, 280 horsepower, or .98 hp per cu.in.... then we can start to plot! This is what I want to do here. I'm going to go down the list of current Bonneville class records (except sports car classes) and try to pick out a few that show some possibilities for being broken with a reasonable amount of ingenuity. Then I shall estimate the true horsepower output of these present record holders, using a mass of performance data on these cars collected in the past, so you can get some idea of what it will take in the engine compartment to beat the record. (In all cases I will quote the equivalent sea-level hp, which is what you'll be shooting for in your development. Actual output on the Salt Flats averages 20% lower due to the altitude and high temperatures. However, air drag on the car is also less, so top speed is only off 2 or 3% as compared with sea-level performance.)

And one other thing: In singling out certain records for attack I don't mean to imply in any way that the present record-holders have not done a good job. None of the records will be a pushover. But where you have certain

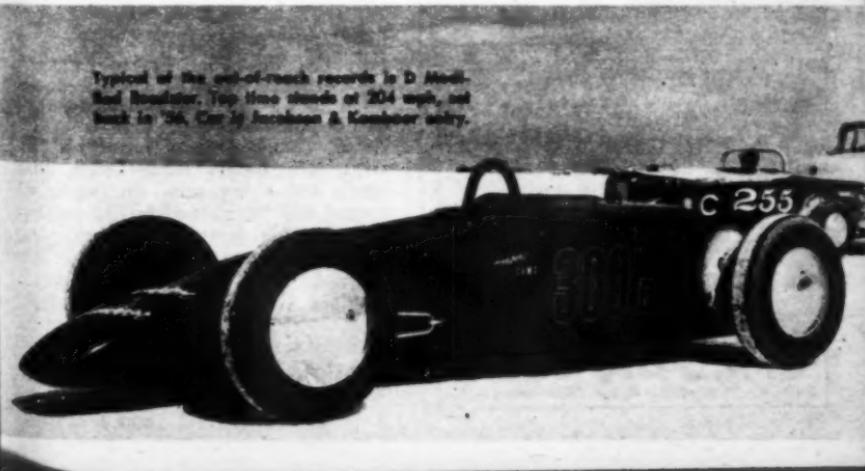
One solution for good chance at records is to drop a class, then supercharge. Drawback for '58 Nationals; no blowers over 305 cu. inches.



classes where the press of competition is not so great relative performance is bound to be a little lax. You can get by with just a little more air drag per pound of car weight, just a little less hp per cu.in., just a bit more frontal area than absolutely necessary. If we can build a car that matches the top cars in these departments we should be able to snag us a record. Here's the story...

The most logical classes to look at first are the "Gas" classes. These classes, for stock-height roadsters and fully-equipped coupe/sedans, were only set up a couple of years ago, in an

Typical of the out-of-reach records is D Model Roadster. Top time stands at 204 mph, and that is '56. Car is Jackie & Kenzie's entry.



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effort to give the "man in the street" a chance at the record book. They have been very popular since—but more with amateurs than experts. The sub-classes based on piston displacement are different here than in the regular fuel classes. For the coupe/sedan division Class C is for anything up to 305 cu.in.; Class D goes from 306 to 371 cu.in.—and E is for 372 and up. Blowers are limited to 305 cu.in. Undoubtedly the easiest record in this bunch is the E mark of 141.6 mph, set by Dr. Nathan Ostich with a 400-cu.in. Chrysler 300-B. This took about 300 hp at the clutch

Jug-engined A Comp Coupe (an 8 cylinder) is holder of class record. Set during '49 trials, this rounds of 125 mph—but improvement would not be too difficult to undertake.



on this big, heavy car. The chances for breaking the record are excellent. Since engine swaps are permissible, any big bore and stroker in a smaller, lighter body ought to do the job. You wouldn't even need 300 hp.

The Class D Coupe/Sedan record of 145.2 mph, set by Don Stevens in a '56 Golden Hawk, doesn't look too tough either. This 352-cu.in. engine put out about 275 honest horses with dual quads and a hot cam. An engine of around 360 cu.in., modified to develop a reasonable figure of .9 hp/cu.in., should be able to exceed 160 mph. We might as well forget Karol Miller's fabulous C Gas mark of 150.1 mph with the '56 Ford. I figure he had to have not less than 310 hp to turn this with that body—and it takes some doing to get this with only 303 cu.in.

ROD & CUSTOM

BONNEVILLE

continued

You'd be biting off a big chunk to tackle it. Incidentally, don't forget that Bonneville rules say supercharged engines move up one class. Thus a blown engine up to 305 cu.in. could attack Class D records.

In the Gas Roadster division Class C runs up to 305 cu.in., but D goes from 306 to 488 cu.in. (with no blowers over 305). The current records are 145.9 mph and 153.9 mph on C and D respectively. The C record took about 280 hp from an Arduin-Merc, and the D about 330 hp from a big Caddy, both engines being run in highboy A Ford roadsters. These are pretty fair outputs for pump gas, and neither record would be any pushover (remember, a roadster has considerably more air drag in relation to frontal area than a sedan).

Now let's get into those all-out classes - the regular SCTA competition classes that have been in effect at Bonneville for years. These are based on body type (which determines air drag) and sub-divided on piston displacement (which determines hp). Fuel choice is free, and superchargers move up one class. We have seven displacement divisions, though not all are open in each body class. The limits are:

Class H - 0-45 cu.in.

Class O - 46-91 cu.in.

Class A - 92-183 cu.in.

Class B - 184-260 cu.in.

Class C - 261-305 cu.in.

Class D - 306-488 cu.in.

Class E - 489 cu.in. and over

(No blowers on classes D and E)

Very briefly, the body divisions run about like this: The Roadster class requires stock body height and width, but fenders can be stripped. The Modified Roadster class requires a production body of stock height and width, but you can channel, belly-pan, streamline, etc. The Coupe/Sedan class is like the Roadster, requiring stock body height and width, but allowing a 6" frame drop. Competition Coupe/Sedan

continued on p. 60

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more GO for the

Part II

By Roger Huntington, SAE

With inserted comments courtesy Editor Murray

So now to the big question: *Does it go?* Before I get into this I would like to emphasize that the standard 5:1 (60/12) sprocket ratio does not let the engine wind up tight enough to utilize its full potential performance. A car speed of 32 mph represents 5100 rpm — and that's about as fast as you're going to go with a single engine (and bigger tires make it worse).

Nearly a year ago, a perfectly stock Go-Kart, with a non-reworked engine, stock tires and the 5:1 sprocket ratio, turned 38 at the drags. Non-believers requested a re-run. Wham! The rod let go midway between the lights, yet the car coasted on through with a clock speed of slightly over 32!

On the other hand, the accompanying power curve for the chain saw engine with needle-bearing rod shows that peak power must be developed at somewhere around 5500 rpm. Furthermore, as is well known with any top-gear race car, you've got to gear to wind well *above* the power peak on the straightaways so you can pull good torque coming out of the turns.

So I'd say a usable rpm of around 6500 and a sprocket ratio around 7:1 would be just about right.

But back to Napoli and Knight and standard gearing. The most vivid evidence of the success of this hop-up experiment was seen by clocking a car around the outer circuit of the Michigan State University driver training course — which is pretty much flat out all the way for an expert driver. Using the same chassis and driver (Napoli in this case, as he weighs 40 lbs. less than Knight), the best *average* speed for the fully-stock engine was 26.9 mph — compared with a best figure of 30.4 mph with the modified mill. (Neither engine had a muffler.) That might not sound like a big increase... but let me remind you that horsepower required to move a car increases as the cube of speed. So this means our friends got about 45% more horsepower with little more than a grinder and file.

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ROTATION REVERSING ON THE #750

Speed addicts wishing to add a second engine to their single-engined rods will want to know how the direction of rotation can be reversed. This is necessary, for with engine mounting procedure, the car would try to run the wrong way with the standard engine fitted so as to power the right rear wheel. The West Bend #750 engine won't run in reverse simply by starting it up that way. It isn't like a lot of smaller model airplane engines! The primary reason is that a certain amount of degrees advance must be given the timing, and if direction were reversed advance would become retard.

Two things are needed for the conversion. 1, reposition the flywheel and, 2, reposition the breaker cam on the crank. The flywheel must be removed for this, and a new keyway cut 62° from the original slot. (See photo.) Simply replace the wheel using the new slot for the key. While the flywheel is off, slide the cam off the crank. You'll note that the outer side of it is marked with an arrow showing rotation direction. The cam has to be replaced with the arrow toward the timing plate, and it also has to be repositioned 62° from the original location. Since this is a bit more critical than the flywheel, here's how to do the job: file the cast-in key from the cam. Slide the cam onto the crank. Turn the crank until the piston is $\frac{1}{8}$ " before top dead center. Holding the crank in that position, rotate the cam until the points begin breaking. Scribe a small mark on the cam in line with the keyway in the crank. Remove the cam and file a triangular keyway into the cam so that the inward end of the flywheel key will also lock the cam in position. Now reassemble the engine and...GO!

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CUSTOM

YOU CAN CRACK BONNEVILLE continued from p. 57

corresponds to Modified Roadster, so you can chop, channel, and streamline (not section) as long as you use a basic production body. The Lakester class is for non-production bodies that do not exceed 36" maximum width, and without wheel coverings. The Streamliners have non-production bodies with covered wheels.

In almost all the above classes the "easiest" records are in the lower displacement divisions; in the high displacement classes (B, C, D, E) competition has been rough and rugged for years, and the records have been boosted pretty much out of sight — at least in terms of the greenhorn. An example is the E Lakester record of 229.7 mph, set just last year by the Brissette & Eichenhofer belly tank. This car had a supercharged 331-cu.in. Chrysler engine (which put it in Class E) that developed over 700 hp! That's meat for the big boys, not the beginner.

On the other hand, there are great

possibilities in some of the lower displacement classes. In Class H in both the Lakester and Streamliner divisions, for instance, neither record engine developed over 35 or 40 hp. Both cars here were British Cooper race cars with 41-cu.in. Norton competition motorcycle engines. The Lakester mark is 92.3 mph and the Streamliner mark of 118.3 was set with a special factory car prepared for world record attempts. These cars did not have impossibly-low drag per pound of weight, nor was the hp per cu.in. fantastic. I'm thinking that a 44-cu.in. Crosley engine, hopped up with all the goodies plus about 25% nitro, could put out as much as 60 hp at 7000 rpm for a few minutes — long enough to raise both these Class H records by 10 or 15 mph!

The Class O Lakester and Streamliner records, for engines up to 91 cu.in., look even easier. The Lakester mark is only 111.6 mph, set in 1953 by George Barber in a little belly tank



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ROD & CUSTOM

car. He used a Ford V8-60 engine, sleeved and de-stroked from the original 136 cu.in. down to 88 inches. It developed between 60 and 65 hp. The O Streamliner record of 136.9 mph was set by Bill Burke in 1952 with a tiny 740-pound fiberglass streamliner powered by a 61-cu.in. Harley-Davidson motorcycle engine. Output here was about 50 hp at 5500 rpm. The possibilities in this class just scream at you. Certainly the V8-60 is good for more than 60 hp when brought below 91 cu.in.; an output of 80 hp at 6500 should be readily obtainable on a hot fuel. Or there are several domestic motorcycle engines that can be bought used at low prices, and that have been developed to put out more than 1 hp/cu.in. for track racing on alky. The big Harley 74 twin, rated 50 hp at 5500 rpm stock, should be good for 80 hp when hopped to the gills. Don't forget the possibility of a big outboard engine; Mercury now has a 66-cu.in. 6-cylinder that develops 70 hp at 5800 rpm, and weighs only 180 lbs. This could be souped to 80 hp. And, of course, don't forget the possibility of *supercharging* the Crosley engine to get in Class O. One of the small positive-displacement blowers on the market — like the American Judson or British Shorrock or Marshall-Nordec — could supply 15 or 20 lbs./sq.in. boost pressure on this small engine, and practically assure 80 or 90 hp on alky. Who'll be first to try it?

Up in Class A (92-183 cu.in.) things get a little rougher. The Lakester record here of 162.4 mph was set last summer by Baldwin, Summerfield, and Williams with a sleeved Ford B block and old Riley 4-port rocker arm head. To go this fast with that belly tank they had would take close to 220 hp.



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THEM AND LETS SEE WHA
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TOP... CHOP-A-TOP...
TOP... CHOP-A-TOP...
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MILLAR

YOU CAN CRACK BONNEVILLE

continued from p. 61

Better forget it; they tipped the can too far to be easily overtaken by the greenhorn! But look at the A Streamliner record. It's only 162.9 mph, barely over the A Lakester mark. This was set way back in 1950 by the famous Xydias-Batchelor streamliner, using a V8-60 engine. The performance suggests not over 120 or 125 hp was available. Surely we can do better than this with 183 cu.in. and nitro to work with. In fact, if you were to transplant the above B.S.W. A Lakester Ford engine (220 hp) in the X-B car, it should go at least 190 mph! There's work to be done here.

Class A competition is also open in the Competition Coupe/Sedan and Modified Roadster divisions. Just last year Bill Milliken set a new A Comp. Coupe record of 125.6 mph with a weird-looking needle-nosed thingie running a 5-cylinder Jaguar engine! He removed No. 6 piston and rod to bring the displacement down from 210 to 175 cu.in., and bob-weighted the crankpin for balance. Worked fine—and put out about 140 hp. But we can do better. What would 200 hp have done for the Milliken thingie?...just about 140 mph! At first glance it would seem that Ak Miller's old A Modified Roadster record of 137.6 mph, set in 1952, would offer a target. But a little slide rule slipping shows that his nitro-loaded bore and stroked V8-60 must have been kicking out over 180 horses to turn that speed pulling the high drag of the roadster.

And so it goes. In the larger displacement classes, as mentioned, there aren't too many possibilities for the beginner. Power outputs up there are generally around 1 hp/cu.in. or above, which is hard to beat even with a little nitro. Possibly the best idea would be to approach a record by dropping displacement down into the next lower class and then supercharging. Not too many of the records are presently held by blown cars—and it's probably as easy to get 1 1/4 or 2 hp/cu.in. with a blower as to get 1 hp/cu.in. without it.

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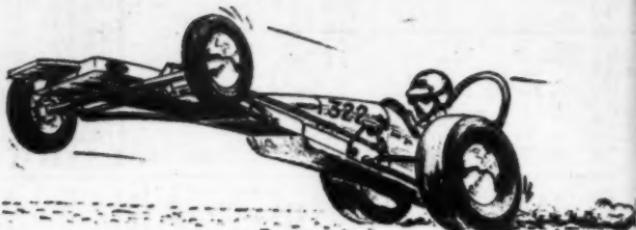
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backpressure

BY ROGER HUNTINGTON, SAE



WITHOUT DOUBT the most important development in the field of drag racing in the last six months has been the phenomenal rise of the *supercharger* in the gas divisions. Big-time builders are flocking over to pressure induction by the dozens. A quick look at the record book will show why. Just last September Buddy Sampson won the NHRA Nationals with a speed of 141.5 mph, using a 461-cu. in. unblown Olds engine in a 1300-pound slingshot. Now, just a few weeks ago, Bill Crossley went 161.7 mph on gas with a 331-cu. in. supercharged Chrysler in a 1600-pound dragster.

There's a lesson to be learned here. I have studied these performances of gas-burning dragsters in some detail, and have come up with a few conclusions. Most important, there appears to be a sharp limit on the air-breathing ability of the port and valve systems on our basic passenger car engines, even when highly modified. Consider: A small engine of less than 300 cu. in., like the Chev, can develop well over 1 hp per cu. in. on gas when set up right. The 283 Chev in the "Dragliner" appears to put out about 310 hp at 6200 rpm. As the engine gets bigger the specific output goes down. The "Money Olds" that won the NHRA Nationals developed about 360 hp at 5000 rpm with its 461 inches. Some big 450-cu. in. unblown Chryslers have shown around 400 hp. But it certainly looks from here like present valve and port layouts could not pass enough air to generate more than maybe 450 hp — *regardless of the cubic inches pulling on them!* There seems to be a virtual "breathing barrier" on unblown automotive-engine dragsters at somewhere around 146 mph.

So the obvious answer — (this side of nitro, anyway) — was simply to put *pressure* on the fuel-air mixture in the manifold. This is the easiest way to increase the amount of air that will flow through a given orifice (in this case the valve). It has worked like a charm. Mickey Brown soon exceeded 150 mph with a blown Olds, and now Crossley has broken 160 with his Chrysler. Horses? I am certain that the Crossley car must put out very close to 600 of 'em — or about 1.8 hp/cu. in. It has taken some tall doin' to get that kind of stuff out of pump gas with an American passenger car engine. And all of it, of course, has been done with the basic Roots-type positive-displacement supercharger (such as the GMC diesel truck blowers). Any supercharger man will tell you that this type is poorly adapted to the job. No telling what we might do in the future with more efficient types of compression!

I still can't say that a good blown gas engine is any match for a good unblown nitro engine... but just give those gas boys another year, and then see! •

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